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FORESTRY BULLETIN

August 1973

FOREST INSECT AND DISEASE CONDITIONS IN ONTARIO



Level of protection obtained against the spruce budworm by the aerial spraying of Thuricide in Lake Superior Provincial Park, Ontario. On the left is pictured a balsam fir branch taken from a plot sprayed with 4 billion international units of *Bacillus thuringiensis* (Bt) in $\frac{1}{2}$ gal. of spray per acre, and on the right is a typical branch taken from an adjoining untreated check plot showing the intensity of feeding damage on new shoots. Operational responsibility for this trial: Ontario Ministry of Natural Resources; evaluation and entomological background: Great Lakes Forest Research Centre; and insect pathology and technical assistance in mixing: Insect Pathology Research Institute.

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This bulletin describes forest insect and disease conditions determined from surveys made during June and July and is the second in a series of bulletins on this subject to appear during 1973. The "regions" referred to herein are survey regions to which teams of field technicians have been assigned, as defined by the map appearing in the May bulletin.

FOREST INSECTS

Spruce budworm, *Choristoneura fumiferana* (Clem.)

Defoliation surveys for the spruce budworm are now essentially complete and a number of changes in infestations from 1972 are reported.

In Quetico Provincial Park in northwestern Ontario the outbreak has largely abated. However, a heavy infestation over an area of 1 square mile occurred near Prairie Portage on Basswood Lake, and several other pockets of moderate defoliation were mapped to the west of Prairie Portage along the international border. The largest of these were south of Robinson and Argo lakes. Defoliation was also mapped within an area of roughly 8,500 acres from Tanner Lake westward to Indian Reserve No. 25D and southward from there past Martin Bay on Lac La Croix. All of this area except for the Indian Reserve was included in the 1973 provincial aerial spraying operation but the defoliation was thought to have resulted mainly from spruce budworm feeding before the sprays were applied. Toward Thunder Bay, several infestations in remote areas that have been surveyed and treated over the past 4 years now appear to have been knocked out. These were located near Northern Light, Granite, and Gunflint lakes. In terms of defoliation extent, infestations in northwestern Ontario have been reduced by about 85%, namely from 70,000 acres in 1972 to 10,000 acres in 1973. Approximately 77,000 acres in Quetico Park were sprayed by the Province in 1973. Pupal counts also indicated that, except for known infestations, numbers are low, and detailed egg surveys are now under way to ascertain where high populations remain.

In northeastern Ontario, infestations over an area of approximately 4,000 square miles north and east of Chapleau were reduced from heavy in 1972 to trace or light (See accompanying map). This is attributed largely to the severe snowstorm that was accompanied by freezing temperatures in late May, 1972. The area of near collapse coincides closely with the area hit worst by the storm, where virtually all of the new shoots of balsam fir were then killed. Small pockets of detectable defoliation were found scattered through this area in 1973 and infestation boundaries around Chapleau and Foleyet were vague and difficult to define. Elsewhere in northeastern Ontario, defoliation was severe in many locations south of Chapleau and the outbreak expanded along the southern boundary, as shown on the accompanying map. Farther to the north, budworm populations declined between Geraldton, Kapuskasing and Cochrane. However, moderate-to-heavy infestation was present throughout several townships south of Timmins. In the Temagami-North Bay area where severe infestation in 1972 was limited, moderate-to-severe defoliation was mapped in a north-south band between

● Kapuskasing

● Timmins

● Chapleau

QUEBEC


L. Superior

● Sault Ste. Marie

● Sudbury

U.S.A.

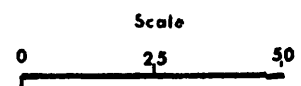
Northeastern Ontario

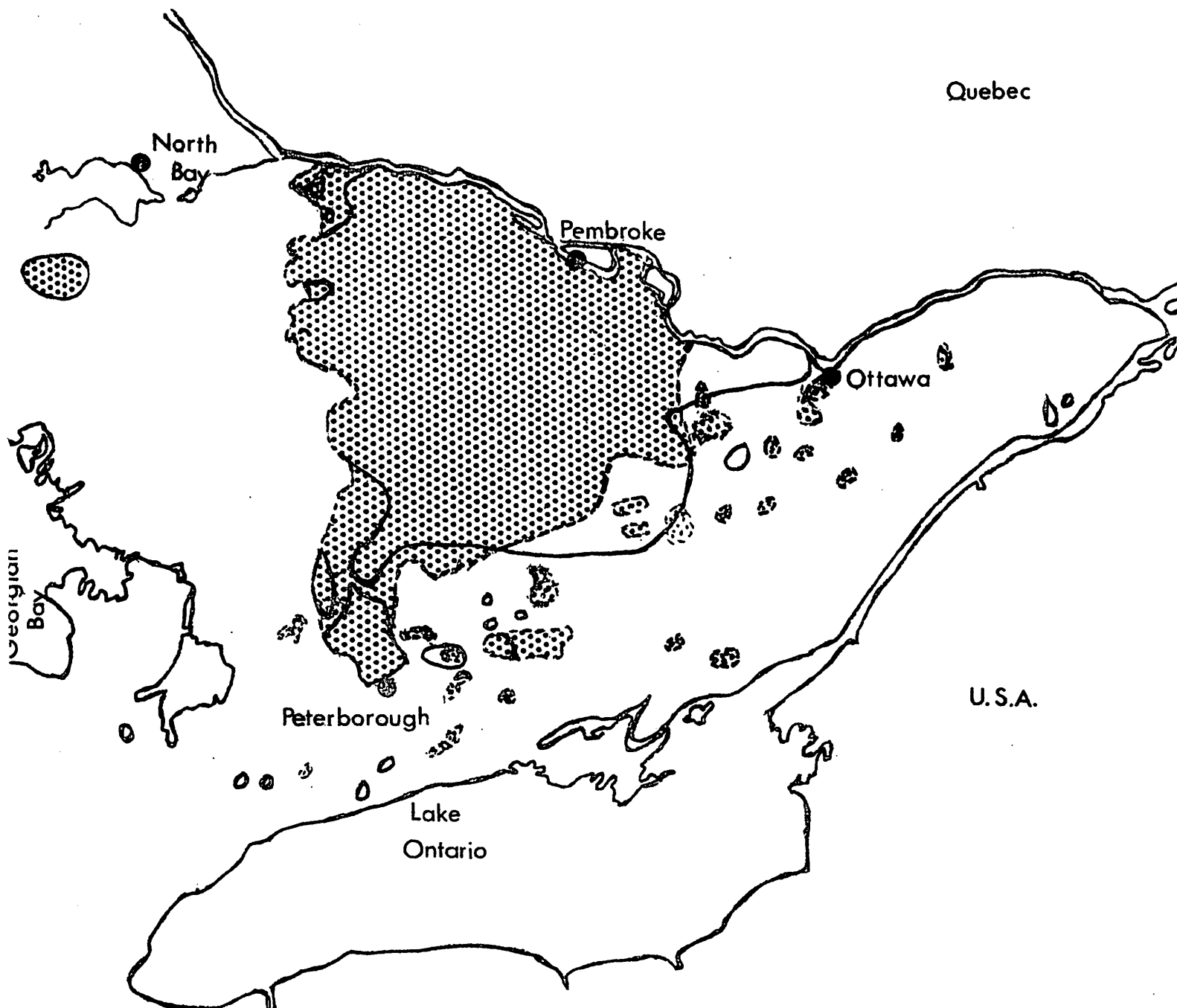
Moderate to Severe Defoliation in 1973 

Boundaries of Moderate to Severe Spruce Budworm Infestation

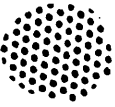
in 1972 

in 1973 





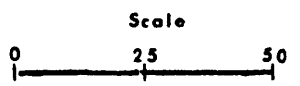
Southeastern Ontario

Moderate to Severe Defoliation in 1973 

Boundaries of Moderate to Severe Spruce Budworm Infestation

in 1972 

in 1973 



Highway 11 and Lady Evelyn Lake south to Marten River and west from McLaren's Bay on the Timiskaming-Ottawa River, as shown on the map. Several pockets of severe first-year defoliation were mapped northwest of Lake Nipissing and near Mattawa. Over all, the area of northeastern Ontario containing infestation was 12.5 million acres, a net reduction of about 1 million acres since 1972.

In southeastern Ontario, moderate-to-severe defoliation continued and infestation boundaries remained essentially the same as in 1972 (See map). Although defoliation around Pembroke was classified as moderate to severe, pockets of light defoliation were noted south of a line joining Pembroke and Barron Lake. The persistent westward spread of infestation appears to have stopped although a large influx of egg-laden moths was noted in early July in some uninfested areas between Parry Sound and Gravenhurst. A lessening of infestation intensity occurred on open spruce along the outbreak's southern fringe. A net reduction since 1972 of almost 800,000 acres in the total area affected by the spruce budworm in southeastern Ontario was recorded. In southwestern Ontario, light populations persisted at numerous points.

Survey personnel again participated in aerial spraying operations carried out by the Ontario Ministry of Natural Resources by delimiting for treatment areas with the highest spruce budworm populations, providing information on insect development used in timing sprays and spray sequence, and evaluating the results in terms of foliage protection and larval knock-down. Results with Zectran obtained in Quetico and Lake Superior provincial parks were particularly encouraging this year as were the first trials carried out by the Province using a biocide *Bacillus thuringiensis* (See cover page).

Tree mortality resulting directly from the current outbreaks of spruce budworm in Ontario has been confined to relatively small areas (i.e., small when present mortality is compared with that which can be expected over the next several years should outbreaks continue in the present manner). By far the largest area lies east of Onaping Lake north of Sudbury where one half or more of the balsam fir and many of the spruce growing in mixture are now dead over approximately 300 square miles. Elsewhere in the Central Region, numerous pockets of *apparent* mortality have been observed around Chapleau but few have been ground checked. Those so far checked are primarily young stands of balsam that have been literally stripped of foliage through infestation and back feeding by large numbers of larvae. These pockets were located in the townships of Borden, McGee, Chewett, Collins, Pattinson, Sadler, Copperfield, Bonar, Marshall, Hill, and Township 25 Range XXII.

In Algonquin Provincial Park, four pockets of tree mortality, mainly in balsam fir, have been found. These are located (a) on the McLaughlin-Canisbay township line west of Lake Opeongo, (b) north of Booth Lake in Preston Township, (c) along Lone Creek in Stratton Township and (d) in scattered woodlots in Ross and Bromley townships. Farther

south, balsam fir mortality increased near Bass Lake in Galway Township (Peterborough County) and along York Creek north of Elephant Lake in Bruton Township (Haliburton County).

Some scattered tree mortality has, of course, been occurring in Quetico Provincial Park but with the improved infestation picture that is emerging, this seems to be a problem of academic interest primarily.

Large aspen tortrix, *Choristoneura conflictana* Wlk.

This pest again caused widespread defoliation of aspen over a large part of northern Ontario. In the northwest, moderate infestations recurred in a 35-mile-wide block around Red Lake. Infestations around Ignace joined with others north of Thunder Bay to cause extensive defoliation from these two centres northward in an arc 100 miles or more wide around the top of Lake Nipigon, thence eastward and southward, narrowing to Longlac. Another area east of the Nipigon River and north of Lake Superior showed extensive defoliation of aspen. Meanwhile, infestations declined southwest of Thunder Bay where defoliation had been both severe and extensive for 5 years, and collapsed in a band directly east of Lake Nipigon where stands of poplars had been badly defoliated in 1972. Farther east in the Northern Region, sharp declines in numbers were evident; however, some considerable defoliation was noted in the Timmins-Iroquois Falls area. In the Central Region, moderate-to-severe defoliation was confined to scattered patches near Foleyet, around Sudbury, north of Espanola and on Manitoulin Island. This represented a considerable reduction in the extent of damage in the Region over 1972. An overall reduction also occurred in the Eastern Region but heavy infestations persisted in the Kirkland Lake-Larder Lake and Matheson-Monteith areas as well as in the Lorrain Valley (southeast of Cobalt) and around McConnell Lake, 40 miles north of North Bay. Several new but small infestations were mapped south of Mattawa. In southwestern Ontario, scattered defoliation was observed on Bruce Peninsula.

Forest tent caterpillar, *Malacosoma disstria* Hbn.

All evidence compiled by the Survey during 1972 and 1973 points to a rapid buildup of forest tent caterpillar numbers over a large part of northern Ontario.

In the Western Region, an infestation between Dryden and Vermilion Bay that doubled in size since 1972 now covers roughly 60 square miles. Several small but new infestations were detected in 1973, two of which were located in the vicinity of Ear Falls. In the Northern Region, another new infestation that covered 50 square miles was mapped between Beardmore and Geraldton and heavy infestations recurred in the townships of Shuell and Mulloy, 60 miles northwest of Hearst. New pockets of moderate-to-severe defoliation were detected closer to Hearst and near Fauquier east of Kapuskasing. In the Central Region, the only noteworthy infestations found were located within a radius of about 30 miles of Sudbury. In the

Eastern Region, small infestations reported in 1972 near New Liskeard expanded and completely defoliated most stands of aspen in the adjoining townships of Dymond, Harris, Casey, Harley, and Kerns. Furthermore, several new areas of moderate and severe defoliation were reported farther south around North Bay and northwest of Lake Nipissing. A general increase was noted in the prevalence of this insect in the southern part of this Region between Georgian Bay and Pembroke. Forest tent caterpillar numbers also increased in southwestern Ontario but numbers were tolerable. A very small pocket of defoliation was found between Northbrook and Kaladar in the Southeastern Region.

It is becoming increasingly evident that the stage is set for a widespread eruption of this troublesome pest that in the 1950's, for example, proved to be such a nuisance to bushworkers, owners of homes and cottages surrounded by aspen trees, and those enjoying outdoor summer recreation over much of northern Ontario. Whether or not populations do erupt, and if so when, will depend, apparently, on weather conditions during and following the hatching of eggs each spring over the next few years.

The European pine shoot moth, *Rhyacionia buoliana* Schiff.

Except for one unusually severe infestation in Albemarle Township north of Owen Sound where 80% of all bud clusters in a 6-acre plantation of red pine were infested this spring, *R. buoliana* retained much the same level of importance in southwestern Ontario as in the past several years. As a rule, about 15% of the bud clusters have been infested.

Jack pine budworm, *Choristoneura pinus pinus* Free.

One infestation in Walbridge Township north of Parry Sound persisted but now is confined to approximately 70 square miles. Elsewhere in Ontario low populations prevail.

Yellow-headed spruce sawfly, *Pikonema alaskensis* (Roh.)

Attack by this sawfly was again sporadic across the Province with occasional open-grown spruce trees severely defoliated. Infestations were greatly intensified on spruce regeneration between Wabigoon and Vermilion Bay, on ornamental spruces in the towns of Fort Frances and Atikokan and in the vicinity of Northern Light Lake, 60 miles west of Thunder Bay.

Larch casebearer, *Coleophora laricella* Hbn.

This is one of very few forest insects brought successfully under control by biological means, namely through the introduction of European insect parasites. For many years this introduced pest has been of little importance on native and European larches in Ontario with only minor and temporary flareups, usually of a single year's duration. In 1973, populations increased generally in the vicinity of Lake Nipissing and in parts

of southern Ontario. Noticeable population flareups also occurred between South River and Burk's Falls, in a European larch plantation east of Aurora, and in Presqu'ile Provincial Park near Brighton. In these instances, heavy feeding caused larch trees to take on an unsightly brown colour in early summer. Throughout the remainder of Ontario larch casebearer populations remained low.

European pine sawfly, *Neodiprion sertifer* (Geoff.)

In general, infestation intensities in southwestern Ontario were lower than in 1972, but defoliation of Scots and red pines was still common. The insect is considered to be distributed continuously in southern Ontario south and west of a line joining Midland and Belleville, but beyond this, new locations to which this introduced pest has spread are being found each year. Populations are also building up and spreading in previously invaded locations where the insect has not been treated.

In the city of Ottawa, the insect has been present for 5 years but in 1973 was found for the first time in the Green Belt. Colonies were found for the first time on roadside Austrian pine west of Bracebridge and near Alice west of Pembroke. Both locations were treated by the Ontario Ministry of Transportation and Communication. A similar highway planting near Gravenhurst, treated in a like manner in 1972, was uninfested in 1973. On Manitoulin Island, colony counts increased in four of the six plantations known to be infested. This year the insect was found for the first time on the Garden River Indian Reserve 5 miles east of Sault Ste. Marie, where the sawfly has been known for 6 years. It is now known from the rearing of 1972 cocoons that *Lophyprolectus luteator* (Thunb.) was present in Mono Township in 1972, 40 miles east of the 1962 release point at Chatsworth.

Satin moth, *Stilpnotia salicis* Linn.

A few instances of heavy defoliation of individual silver poplar trees were again found in Cornwall and Lancaster townships in southeastern Ontario. These are the only known instances of occurrence in Ontario.

Oak leaf shredder, *Croesia semipurpurana* (Kft.)

Although most field reports indicate a decline in populations, moderate-to-severe infestations were reported in some areas. In the Southwestern Region, a sharp decline occurred in Vespra, Uxbridge, Toronto and Mulmur townships, whereas a new area of heavy defoliation was recorded east of Newmarket in Whitechurch Township. Elsewhere west and south of Lake Simcoe, defoliation was generally light with scattered pockets of moderate defoliation. Moderate-to-severe defoliation recurred in Durham and Peterborough counties and moderate defoliation was noted at several points in the Southeastern Region. In the Eastern Region defoliation was

generally light except for a few pockets of moderate defoliation northwest of Pembroke. In the Central Region, severe defoliation recurred in many oak stands on Manitoulin Island and infestations declined from heavy to moderate at Hiawatha Park and Garden River near Sault Ste. Marie, and in the Blind River area.

Other Noteworthy Insects

Four species of leaf miners which caused widespread browning of eastern white cedar over the past several years, across southern Ontario north of Lake Ontario to Ottawa, were greatly reduced in number in 1973. Unsightly tents made by the eastern tent caterpillar, *Malacosoma americanum* F., were abundant on black cherry, hawthorn and wild apple in southern Ontario. Light and moderate infestations of the pine spittlebug, *Aphrophora parallela* (Say), were reported on a number of Scots pine plantations in the south. Infestations of balsam fir sawfly, *Neodiprion abietis* complex, continued to decline in the southeastern corner of the Eastern Region, damage being mainly light with occasional pockets of moderate defoliation on balsam. The sawflies *Neodiprion pratti banksianae* Roh. on jack pine and *N. nanulus nanulus* Schedl on red pine and jack pine were of little consequence in 1973. Conspicuous damage to the branch tips of jack pine in parts of the Eastern Region was caused by the tip beetle *Conophthorus banksianae* McPherson. The American aspen beetle, *Gonioctena americana* (Schaefer.), caused moderate-to-severe defoliation of understory aspen in parts of the Western Region. Also, moderate-to-heavy infestations of the leaf miner *Lithocolletis ontario* Free. were recorded at locations in the Thunder Bay and Kenora areas.

TREE DISEASES

Red Pine Shoot Blight, *Sirococcus strobilinus* Preuss

Extensive surveys for this pathogen showed that its distribution was more widespread than at first anticipated. In northwestern Ontario, infection levels on red pine varied but in a few instances were severe, and the disease was widely scattered. The disease was also found in the Pancake and Agawa provincial parks north of Sault Ste. Marie and heavy infection was found in Township 10E south of Chapleau.

Tip Blight of Juniper, *Phomopsis juniperovora* Hahn

An increase in the incidence and infection levels of this tip blight and in the amount of severe browning of red cedar was reported in Hallowell and in North and South Marysburgh townships of Prince Edward County. Increased infections were also noted on ornamental juniper at a number of locations north of Lake Ontario.

White Pine Blister Rust, *Cronartium ribicola* J.C. Fischer

Moderate-to-heavy infection levels were reported from several regions. Top killing and branch mortality were particularly common on white pine in northwestern Ontario, but the heaviest impact reported was on 10- to 15-year-old trees in the Sudbury area.

Pine Needle Cast, *Lophodermium pinastri* (Schrad. ex Hook.) Chev.

Severe browning and considerable mortality of red pine seedlings were reported in early spring in the St. Williams Provincial Nursery. Damage was less severe in the Midhurst and Orono nurseries. Dead and infected seedlings were destroyed and Maneb was used by managers in attempting to eliminate this serious nursery problem.

Scleroderris Canker, *Gremmeniella abietina* (Lagerberg) Morelet

During the first half of the field season detailed examinations were made of seven of the 40 Scleroderris hot spots that had been identified by our surveys across Ontario in 1972 in order to identify three that showed the greatest promise of success as locations for sanitation trials. These turned out to be Bastedo Township near Sturgeon Falls, Salter Township near Massey and Neys Provincial Park near Terrace Bay. The approximate acreages of red pine plantations were 10, 25 and 70, respectively. The purpose of these trials is to ascertain whether or not sanitation of plantations heavily infected with Scleroderris is effective and practical, and if so, what are the problems and costs. Sanitation pruning is now being carried out by the Province.

Wind Damage

Severe wind storms on July 8 blew down individual trees over much of northwestern Ontario as far east as Geraldton. Damage was severe over roughly 200 square miles between Lake of the Woods and Dryden, extending in a band northeastward from Lake of the Woods, broadening immediately west of Eagle Lake and extending somewhat more sporadically eastward to Dryden. Many of the trees that were not uprooted were broken off 10-15 feet above ground level. Beyond this main area of damage were small pockets of wind-throw, one around Dominion Lake east of Sioux Lookout, 16 square miles in size; a second 30 miles north of Upsala, 24 square miles in size; and a third north of that running 18 miles northeast of Sturgeon Lake and covering roughly 80 square miles. Other relatively small pockets of blowdown were recorded southeast of Lake of the Woods, west of Fort Frances, and in Quetico Provincial Park.

Winter Drying

Much browning and needle cast of jack pine trees were reported southwest of Thunder Bay extending westward into the Atikokan Management Unit. This condition was also recorded in an area south of Lac Seul. Although no mortality resulted, trees showed unusually thin crowns caused by the shedding of needles. An element of uncertainty surrounds the implication of an associated needle cast fungus, *Davisomycella ampla* (Davis) Darker, found in these areas. The more usual type of winter drying on red and white pine was noted in northeastern Ontario in the vicinity of Marne and Sinclair lakes east of Gogama and in localized areas of southern Ontario such as in Rama Township, Simcoe County and Amaranth Township in Dufferin County. Less-severe browning was also present in the Northern and Eastern regions.

Top and Branch Killing of Exotic Pines

This spring, concern was expressed by Christmas tree growers in parts of southern Ontario over the appearance of dead tops and branches on varying proportions of their Scots and Austrian pines from Beverly Township near Hamilton, north to Georgian Bay and eastward from there through Durham County as far as Tweed. Damaged trees appeared more or less at random throughout plantations and although plantations on all exposures were affected, it would appear that the worst hit were in low-lying areas. Up to one-half of the trees in some instances were damaged.

Owing to the urgent need to determine the cause, much time was spent on surveying the condition, examining submitted samples, culturing affected material and checking weather records. Dr. C. E. Dorworth has ruled out Scleroderris canker as a possible cause. No evidence has been found to indicate that a virulent pathogen was present. In the spring, no obvious signs of insect involvement were found but by July, *Pissodes* larvae were developing in dead branches. Recently, adults that were dissected from dead branches were identified as *Pissodes approximatus* Hopk., a species which on Scots pine characteristically attacks dead tissue.

On most dead branches, the 1972 buds were soft and without sign of growth; however, in rare instances these buds were alive in the spring and gave rise to new shoots which later died. Also, in a few instances new shoots were normal but patches of dead tissue were present, usually on the north side, back on one of the internodes. Pathologists who have examined the condition believe evident symptoms indicate that some factor has predisposed trees to the attack by a weak parasitic fungus that would otherwise be of little importance. This fungus is likely to be *Cenangium ferruginosum* Fr. which was abundant on dead and dying tissues. The factor predisposing trees to the fungus remains less certain but is thought to be an unusual type of weather phenomenon such as may be caused by an ice storm, drying, extremes of temperature or some combination thereof. This is the first instance of this kind of damage reported to the Unit in over 25 years and since virulent pathogens and primary insects have been ruled out, it is unlikely that the condition will worsen or reappear in 1974.

Other Noteworthy Diseases

Foliage diseases were not as prevalent as usual this year. The Northern Region was the only one to report much ink spot of aspen, *Ciborinia whetzeli* (Seaver) Seaver. Little change can be reported in the incidence and distribution of the various important gall rusts and cankers.

August 21, 1973

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